Log No. ___132___
TAG Revision 6/25/21

STATE OF WASHINGTON

STATE BUILDING CODE COUNCIL

Washington State Energy Code Development

Standard Energy Code Proposal Form

Code being amended: ☒ Commercial Provisions ☐ Residential Provisions

Code Section # C403.3.2

Brief Description:

On January 10, 2020 DOE published new boiler efficiency requirements for boilers manufacturer after 1/20/2023. These are proposed for adoption into the WSEC.

The integrated draft has a column for efficiency as of 3/2/2022. This is well before any plausible code effective date so values where different are moved to the Minimum Efficiency column and the as of 3/2/2022 column is changed to the new DOE as of 1/10/2023 values. If the actual code effective date is determined to be after 1/10/2023 then the after 1/10/2023 value should be moved to the minimum efficiency column and the as of 1/20/2023 column deleted.

Proposed code change text: (Copy the existing text from the Integrated Draft, linked above, and then use underline for new text and ~~strikeout~~ for text to be deleted.)

TABLE C403.3.2(6)
GAS- AND OIL-FIRED BOILERS—MINIMUM EFFICIENCY REQUIREMENTS[i]

EQUIPMENT TYPE[a]	SUBCATEGORY OR RATING CONDITION	SIZE CATEGORY (INPUT)	~~MINIMUM EFFICIENCY~~	~~EFFICIENCY AS OF 3/2/2022~~1/10/2023 MINIMUM EFFICIENCY	TEST PROCEDURE
Boilers, hot water	Gas-fired	< 300,000 Btu/h[g,h] for applications outside the US	~~82% AFUE~~	82% AFUE	DOE 10 CFR 430 Appendix N
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	~~80% E_t^d~~	~~80~~84% E_t^d	DOE 10 CFR 431.86
		> 2,500,00 Btu/h and ≤ 10,000,000 Btu/h[b]	~~82% E_c^e~~	~~82~~85% E_c^c	
		> 10,000,00 Btu/h[b]	~~82% E_c^e~~	82% E_c^c	
	Oil-fired[f]	< 300,000 Btu/h[g,h]	~~84% AFUE~~	84% AFUE	DOE 10 CFR 430 Appendix N
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[e]	~~82% E_t^d~~	~~82~~87% E_t^d	DOE 10 CFR 431.86
		> 2,500,000 Btu/h and ≤ 10,000,000 Btu/h[b]	~~84% E_c^e~~	~~84~~88% E_c^c	
		> 10,000,00 Btu/h[b]	~~84% E_c^e~~	84% E_c^c	
Boilers, steam	Gas-fired	< 300,000 Btu/h[g]	~~80% AFUE~~	~~80~~81% AFUE	DOE 10 CFR 430 Appendix N
	Gas-fired—all, except natural draft	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[b]	~~79% E_t^d~~	~~79~~82% E_t^d	DOE 10 CFR 431.86
		> 2,500,000 Btu/h and ≤ 10,000,000 Btu/h[ab]	~~79% E_t^d~~	79% E_t^d	

		> 10,000,000 Btu/h[b]	~~79% E_t^d~~	79% E_t^d	
	Gas-fired—natural draft	≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[b]	~~7779% E_t^d~~	~~7981~~% E_t^d	
		> 2,500,000 Btu/h and ≤ 10,000,000 Btu/h[ba]	~~7779% E_t^d~~	~~7982~~% E_t^d	
		> 10,000,000 Btu/h[b]	~~7779% E_t^d~~	79% E_t^d	
	Oil-fired[f]	< 300,000 Btu/h	~~82% AFUE~~	82% AFUE	DOE 10 CFR 430 Appendix N
		≥ 300,000 Btu/h and ≤ 2,500,000 Btu/h[b]	~~81% E_t^d~~	~~8184~~% E_t^d	DOE 10 CFR 431.86
		> 2,500,000 Btu/h and ≤ 10,000,000 Btu/h[ab]	~~81% E_t^d~~	~~8185~~% E_t^d	
		> 10,000,000 Btu/h[b]	~~81% E_t^d~~	81% E_t^d	

For SI: 1 British thermal unit per hour = 0.2931 W.

a. Chapter 6 contains a complete specification of the referenced standards, which include test procedures, including the reference year version of the test procedure.

b. These requirements apply to boilers with rated input of 8,000,000 Btu/h or less that are not packaged boilers and to all packaged boilers. Minimum efficiency requirements for boilers cover all capacities of packaged boilers.

c. E_c = Combustion efficiency (100 percent less flue losses).

d. E_t – Thermal efficiency.

e. Maximum capacity – minimum and maximum ratings as provided for and allowed by the unit's controls.

f. Includes oil-fired (residual).

g. Boilers shall not be equipped with a constant burning pilot light.

h. A boiler not equipped with a tankless domestic water heating coil shall be equipped with an *automatic* means for adjusting the temperature of the water such that an incremental change in inferred heat load produces a corresponding incremental change in the temperature of the water supplied.

~~i. This table is a replica of ASHRAE 90.1 Table 6.8.1-6 Gas- and Oil-Fired Boilers—Minimum Efficiency Requirements.~~

Purpose of code change:

Achieve additional energy savings from parking garage controls by adopting 90.1 code language

Your amendment must meet one of the following criteria. Select at least one:

☐ Addresses a critical life/safety need.

☐ The amendment clarifies the intent or application of the code.

☒ Addresses a specific state policy or statute.
(Note that energy conservation is a state policy)

☒ Consistency with state or federal regulations.

☐ Addresses a unique character of the state.

☐ Corrects errors and omissions.

Check the building types that would be impacted by your code change:

☐ Single family/duplex/townhome

☐ Multi-family 1 – 3 stories

☒ Multi-family 4 + stories

☒ Commercial / Retail

☒ Institutional

☐ Industrial

Your name Mike Kennedy

Email address mikekennedy@energysims.com

Your organization Mike Kennedy, Inc

Phone number 3603010098

Other contact name Click here to enter text.

Economic Impact Data Sheet

Briefly summarize your proposal's primary economic impacts and benefits to building owners, tenants and businesses.

Costs and saving are determined by DOE to be cost effective.

Provide your best estimate of the construction cost (or cost savings) of your code change proposal? (See OFM Life Cycle Cost **Analysis tool** and **Instructions;** use these **Inputs**. **Webinars on the tool can be found Here and Here**)
$0/square foot (For residential projects, also provide $0/ dwelling unit)

Show calculations here, and list sources for costs/savings, or attach backup data pages

No independent cost calculation was done. Costs and saving are determined by DOE to be cost effective.

Provide your best estimate of the annual energy savings (or additional energy use) for your code change proposal?

Click here to enter text.KWH/ square foot (or) Click here to enter text.KBTU/ square foot

(For residential projects, also provide Click here to enter text.KWH/KBTU / dwelling unit)

Show calculations here, and list sources for energy savings estimates, or attach backup data pages

No independent savings calculation was done. Costs and saving are determined by DOE to be cost effective.

List any code enforcement time for additional plan review or inspections that your proposal will require, in hours per permit application:

No additional time.